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Commonwealth of Massachusetts
Division of Public Employee
Retirement Administration

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INVESTMENT ANALYSIS REPORT

MASSACHUSETTS CONTRIBUTORY RETIREMENT SYSTEMS
FOR
PUBLIC EMPLOYEES

December 31, 1984 to December 31, 1985

December, 1986

We are pleased to present the first comprehensive report on the investment activity of the Massachusetts Contributory Retirement Systems. Many of you may remember the reports which had been issued by the Division of Insurance (which had oversight responsibility for retirement systems prior to 1983) comparing the investment yield achieved by the retirement systems. That comparison, while consistent with the retirement systems' statutory accounting requirements, did not provide a basis for comparing the investment performance of our public pension systems with those of other governmental pension plans or with private pension plans across the country.

On December 20, 1983, Governor Dukakis signed Chapter 66I into law fundamentally changing the way our public pension systems invest their assets and charging PERA with a greater oversight of investment activity. Long limited by a depression-era creation, the "legal list" of acceptable investments for public employee retirement systems (allowing only government, government agency, railroad, telephone and public service company bonds, and bank and insurance company stocks), the Massachusetts Contributory Retirement Systems were at a competitive disadvantage with other public and private pension plans that could take advantage of a broader range of investment opportunities under a "prudent person" investment standard. Chapter 66I authorized our public employee retirement systems to compete on a level playing field...albeit as sophisticated a one as the investment marketplace.

The new statute established a statewide investment pool, the PRIT Fund, to provide sophisticated portfolio management for local systems who wish to take advantage of the option to participate, and eliminated statutory restrictions on investment activities for the new PRIT Fund, and for the State Employees' and Teachers' Retirement Systems. Chapter 66I also authorized PERA to allow qualified retirement systems to be exempted from the statutory investment restrictions.

Through 1984 PERA worked to establish new regulatory standards for exempting retirement systems from the statutory investment restrictions and guidelines for investment activities after receiving such an exemption. Those regulations were promulgated in February, 1985. At this writing, over 92% of the \$6.4 billion in public employee retirement system assets is being invested free of the antiquated statutory restrictions.

To protect the interests of employees, retirees and taxpayers in this new investment environment of expanded authority for the Commonwealth's 106 retirement systems, PERA initiated development of a centralized data base through which it can track the investment performance and regulatory compliance of all retirement system investment activities.

Tracking \$6.4 billion in assets spread across 106 different portfolios (and recorded in 106 different accounting systems) has been no easy task.

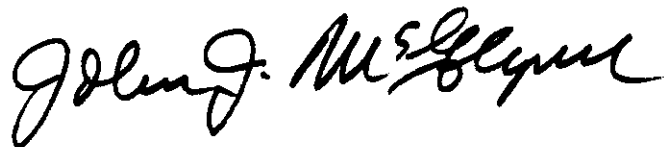
We believe that the hard work of Richard J. Stanton, First Deputy Commissioner combined with the dedication of PERA's Pension Investment Advisory Unit under the leadership of Director Lisa R. Reibstein speaks for itself in the pages that follow. Today we report on investment performance for Calendar Year 1985. With the Pension Investment Advisory Unit well along the learning curve, we expect to report on Calendar 1986 performance before Labor Day.

Many of you have supported our efforts in developing the first centralized data base which tracks the investment activity of the Massachusetts public employee retirement systems. We deeply appreciate the cooperation of the retirement systems and their investment managers in providing investment information on a timely basis.

We thank the Legislature's Joint Committee on Public Service for its constructive review of PERA's investment regulations. Our appreciation and thanks also go to Governor Michael S. Dukakis, Secretary of Administration Frank T. Keefe, the Legislature, and the House and Senate Committees on Ways & Means for providing the resources that made it possible to develop this centralized investment information.

We look forward to building on this data base and commenting on, analyzing, and critiquing the systems' investment performance in ever more timely and frequent reports as we begin to take greater advantage of the full capacity of our monitoring system.

We welcome your comments about this report and our activities in general.

A handwritten signature in black ink, reading "John J. McGlynn". The signature is fluid and cursive, with the first name "John" and last name "McGlynn" clearly distinguishable.

JOHN J. MCGLYNN
Commissioner

The Division of Public Employee Retirement Administration
Pension Investment Advisory Unit

1985

MASSACHUSETTS CONTRIBUTORY RETIREMENT SYSTEMS
FOR PUBLIC EMPLOYEES

INVESTMENT ANALYSIS REPORT

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MASSACHUSETTS CONTRIBUTORY RETIREMENT SYSTEMS
FOR PUBLIC EMPLOYEES

INVESTMENT ANALYSIS REPORT

12/31/84 - 12/31/85

From the first time that PERA broke precedent with the past practices of the Division of Insurance (PERA's predecessor as the state oversight agency for public employee retirement systems) by failing to publish a list comparing the statutory rate of return on investments of the Commonwealth's public employee retirement systems, there has been a consistent pressure to provide comparative information on the investment performance of our retirement systems' billions of dollars in assets.

In refusing to publicize statutory rate of return comparative information, PERA acted on its strong belief that it is infinitely more important for the retirement systems to maximize long term returns rather than short term income. The liabilities faced by our public pension systems extend over decades. The funding of these liabilities, both by appropriation and by increased investment return, requires a steady, long term commitment. The statutory rate of return calculation (which was eliminated by the reforms in Chapter 66I of the Acts of 1983) perversely rewarded those who maximized short term income against those who correctly committed their systems to steady, long term appreciation.

The statutory rate of return provided a measure of investment yield, or income, but took no account of asset appreciation or depreciation. This focus on short term yield sharply diverged from the method for calculating investment rates of return which was developed by the Bank Administration Institute and is generally accepted in the investment community.

The differences between the statutory rate of return and the investment performance standard utilized by other public and private pension plans across the country left the Massachusetts systems at a comparative disadvantage. The other plans received credit for both income and appreciation while Massachusetts public pension systems reported only income. Compounding this historical discrepancy as to what was reported as investment performance, the Massachusetts systems also labored under severe statutory restrictions that limited their opportunity to compete on a level playing field with other investment portfolios.

When Governor Dukakis signed Chapter 66I of the Acts of 1983 into law, he set in motion a major reform in the way public employee pension systems in Massachusetts manage their investment portfolios. Immediately upon enactment of that new statute, the State Employees' and Teachers' Retirement Systems were freed from the state retirement statute's investment restrictions and authorized to invest on a prudent person standard and thus compete on a par with all other public and private pension fund managers.

The new statute also authorized PERA to allow local retirement systems to move beyond the statutory investment restrictions if, by experience and resources, they could show the sophistication to handle broader opportunities.

With assistance and input from many interested parties, PERA developed regulations, procedures and guidelines by which local retirement systems could qualify for the expanded investment authority and under which they would operate when waived from the statutory "legal list" restrictions. During 1985, 59 systems qualified for investment waivers from PERA.

While many retirement systems chose to enter the worldly investment marketplace, unrestricted by statutory limitations, Chapter 66I recognized that the 106 Massachusetts public employee retirement systems vary widely in many ways: the size of the funds, the number of active and retired members, the types of assets in their portfolios, the fiscal capacity of their governmental units, and the composition and investment expertise of the Boards. Recognizing that many systems would see advantages in pooling their resources and obtaining state-of-the-art investment expertise, Chapter 66I established the Pension Reserves Investment Trust Fund as a sophisticated, well managed investment pool which local systems could voluntarily choose to join. As an incentive to those local systems who chose to take what might have seemed a bold step to join the investment pool at PRIT, Chapter 66I set aside an additional state appropriation to participating systems. As of this writing, 10 local retirement systems have taken advantage of the PRIT opportunity.

To protect the interests of employees, retirees and taxpayers in this new investment environment of expanded investment opportunity in a sophisticated and complex marketplace, and to establish a uniform, generally accepted and comparable measure of investment performance, Chapter 66I established the Pension Investment Advisory Unit within PERA.

To meet this statutory mandate, PERA's Pension Investment Advisory Unit established a monitoring system that will track every investment of the 106 public employee retirement systems. A description of the monitoring system follows in a separate section in this report.

To simply say that PERA has established such a monitoring system is to significantly understate the magnitude of the undertaking. An earlier attempt in the late 1970's to create a similar central data base for the investments of the public employee retirement systems failed. From the time the first portfolios were initialized in the early spring of 1985 until the publication of this report today, many long, tedious (and often, overtime) hours of painstaking detail were required from PERA's Investment Analysts to assemble, interpret, input and analyze tremendous volumes of information to bring this project to today's happy milestone.

It has taken nineteen months to complete this performance report on retirement system investment activity in 1985...but we have learned a great deal in the process. Work is already well underway on 1986 investment data, and we hope to report results for this calendar year by mid-summer. PERA's ultimate goal is to provide quarterly reports on a timely basis that can be of assistance to the retirement boards, employees, retirees, taxpayers and others interested in our multibillion dollar pension systems.

When our monitoring system is fully on line, we expect to conduct investment audits of retirement system portfolios and transactions to ensure statutory and regulatory compliance by fund managers, and to offer constructive comments to the retirement boards so that they may best meet their fiduciary obligations. At that point too, it will be possible to do special studies as appropriate (e.g. on the performance of our systems' South Africa free holdings as opposed to those which are not divested, or on the activity of the brokers, managers or custodian banks who serve the retirement systems).

In a related effort, and one aided by the information available through the investment monitoring system as well as that gained from the meticulous examination of the retirement systems' investment records by the Pension Investment Advisory Unit, PERA has distributed a detailed Accounting Manual and held instructional seminars for the staff of all retirement systems. This standardization of the accounting procedures will make tracking investments easier as well as bring to an end the crippling effect of turnover in retirement system personnel. Frequently in the past, the loss of a key person resulted in a system's accounting falling into disarray. Uniformity in accounting procedures replacing personal bookkeeping conventions will ensure greater continuity.

These great expectations for improving the productivity and performance of PERA and our public employee retirement systems only serve to emphasize the importance of this early step. But in our excitement to show how much has been accomplished, both by our monitoring system and the retirement systems we are monitoring, we should not forget to emphasize that this is a first and early step.

All of the investment expertise which has been made available to our Pension Investment Advisory Unit has been unanimous on the critical need not to judge investment performance over short time horizons. We have been convinced, conclusively, that to effectively compare investment performance the investment managers being compared must be seen over a full business cycle...typically three to five years. Some managers perform well in up markets. Others have greater success in down periods. The only true comparison is one that has been made after a full cycle including ups and downs.

The performance measurement that follows in this report is encouraging. Overall, our retirement systems are performing well against standard market indices and against other public and private pension funds. The reader is cautioned however, not to draw too strong a conclusion from a single year's performance, whether comparing our systems against other public and private funds or against each other. This is particularly true for Massachusetts in 1985, where the investment environment for our public employee retirement systems was so dramatically changed by the implementation of Chapter 66I.

Systems that performed well in 1985 by continuing to invest as they had in the past under the legal list may have done well as a circumstance of the 1985 market or they may have done well through insightful investment. Systems restructuring portfolios to take advantage of new investment flexibility may have sacrificed near term performance in exchange for building long term appreciation, or they may have simply invested poorly. Only performance over time will give a reliable answer to these alternatives.

With that caveat, there are several conclusions that can be drawn about the investment activity and performance of the Commonwealth's 106 public employee pension systems and their \$6.4 billion in assets.

There has been a significant increase in the number of systems utilizing professional portfolio investment managers. The days when pension funds in our public employee systems could be managed by a lay board receiving pro bono advice (or help that might appear to raise conflict of interest questions) from a local banker or stock broker are over. The smallest retirement systems are still handling millions of employee, retiree and taxpayer dollars and the fiduciary responsibility of retirement board members requires due diligence. Over 92% of the assets of our public employee retirement systems are now being run by professional managers.

Besides the selection of an investment advisor, the single most important investment decision made by the board of any system is the allocation of the portfolio to different asset classes and the prompt investment of new funds according to that allocation. Careful examination of the Tables that appear in this report clearly shows that those systems who had extensive holdings in cash or cash equivalents (checking accounts, savings accounts, money market funds, commercial paper, certificates of deposit or repurchase agreements) performed poorly in comparison to those systems who quickly put their funds to work in equities or fixed income securities. Some systems with large cash holdings made a conscious (even if, ultimately erroneous) choice in favor of cash and against equity and fixed income securities. Other systems with large cash holdings are victims of poor planning and management that did not get funds promptly invested.

Consistent with the professionalization of retirement system investment management, with the importance of asset allocation, and with the restructuring of portfolios that took place as a result of the Chapter 66I freedom from "legal list" investment restrictions, 1985 saw a significant shift among the systems who had received "legal list" waivers prior to July 31 from fixed income securities into equities. The 51 retirement systems falling into this classification began 1985 with 75% of their assets in fixed income securities and 5% in equities. By the end of the year these systems held 15% of their assets in equities and only 67% in fixed income securities. This restructuring can be expected to continue into 1986.

While the retirement systems only had (on a weighted average basis) approximately 12% of their assets in equities, their performance in this asset class was remarkable. While it may be the result of the "legal list" sector (bank stocks) doing very well (The Keefe, Bruyette and Woods Bank Index showed a 1985 return of 35.35%, which compares to the S & P 500 return of 31.95%), the aggregate equity performance of all Massachusetts public employee retirement systems (excluding the largest four portfolios and funds invested therein), which closed 1985 with \$250 million in equity investments, was 46.23%. Of the 106 Massachusetts systems, 76 outperformed the S & P 500 Index in the equity portion of their portfolios. Again however, let us restate the caveat against rushing to judgment on one year's performance.

Looking at the portfolio's performance as balanced funds, the aggregate performance for all but the largest four portfolios (Boston, State Employees, Teachers and the PRIT Fund) was 22.35%. This compares very favorably to a composite index created to match the aggregate asset mix of the Commonwealth's systems which registered 20.16%. Each of the four largest portfolios cited above exceeded both the composite index and the aggregate performance of the other Massachusetts systems.

Before turning to the comparative and analytical tables, we offer this final caution...the magic of a table of numbers carried out two decimal places is that two decimal places makes numbers appear more accurate than anyone should take them to be. With 106 different portfolios, and unique twists within 106 accounting systems, the casual reader should take the information in this report as an accurate assessment of the relative performance of the systems. We at PERA will continue in our efforts to standardize, sanitize and homogenize the systems' accounting and our investment reporting. Until we have succeeded in that effort, please understand that for some income is recorded here, while for others it is there...some pay investment expenses as a separate appropriation, and others take it out of investment income at the expense of investment performance. It is not that one is right and one is wrong, it is just that they are different...and this is only an early step on the road to consistent reporting on the condition of our Massachusetts Public Employee Retirement Systems.

PERA'S MONITORING SYSTEM

Since January 1, 1985 PERA's Investment regulations have required each retirement system to send to PERA copies of cash book entries for each month, monthly trial balances, and the broker confirmation for every security transaction.

PERA's Pension Investment Advisory Unit assembles this information, interprets it where necessary to achieve uniformity, and enters it into a monitoring system provided on contract to PERA by Interactive Data Corporation. PERA utilized the Annual Statements filed by the retirement systems for the year ending December 31, 1984 to establish the initial portfolio position of each system.

That initial position, and transaction journals indicating investment activity for each quarter as entered by PERA, were sent to each retirement system so that the system could audit PERA's information and insure its accuracy. As an additional check, the closing position for each system as of December 31, 1985 was reconciled to the system's Annual Statement of Financial Condition for the year ending as of that date.

The performance evaluation in this monitoring system is done using Bank Administration Institute Standards, which are those generally accepted in the investment community.

Contributions and withdrawals are entered at mid-month. Purchases and sales are entered on their trade dates. Interest is entered on an accrual basis. Dividends are entered on their ex-date. Market values for the portfolios are appraised quarterly and performance is compounded on a quarterly basis.

For the Boston Retirement System, the State Employees' Retirement System, the Teachers' Retirement System and the Pension Reserve Investment Trust Fund, PERA did not manually enter all transactions of these portfolios in the centralized monitoring system. For these large portfolios, PERA developed a mechanism for a tape-to-tape transfer of information between the custodial bank for the systems (State Street Bank and Trust Company) and PERA's monitoring system. PERA randomly checked the performance calculations of the custodian bank. The performance figures included in the following summaries and reports represent a composite of the randomly checked calculations done by PERA and those of State Street Bank and Trust Company. Accordingly, these four systems are not included in tables #1 through 5. Rather, reports on their activity are included in the summary preceding each table with other methodological differences clearly noted.

The 106th Massachusetts Contributory Retirement System, created in 1985 for employees of the Massachusetts Water and Sewer Authority, was not in existence on January 1, 1985 and is therefore not included in this report. The MWRA Retirement System finished 1985 with assets of \$42,000 in cash.

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MASSACHUSETTS CONTRIBUTORY RETIREMENT SYSTEMS
INVESTMENT ANALYSIS REPORT

SYSTEM RANKING BY ANNUAL PERFORMANCE
Asset Value; Investment Management

PAGE ONE

TABLE # 1

SYSTEM	1985 TIME WEIGHTED RETURN	12/31/85 TOTAL ASSET VALUE (In \$000's)		DATE AUTHORIZED TO INVEST BEYOND THE STATUTORY "LEGAL LIST"		INVESTMENT ADVISOR
		BOOK	MARKET	BY WAIVER	JOINING PRIT	
WOBURN	32.45	11868	11749	0	0	
CAMBRIDGE	31.97	73802	72482	0	0	
SOMERVILLE	29.93	30089	29109	0	0	
CLINTON	28.89	2960	3279	0	0	
PLYMOUTH	28.43	10289	10552	0	0	
WEYMOUTH	28.18	18657	13426	0	84/10/01	PRIM BOARD
DEDHAM	27.95	7854	6987	0	0	
SWAMPSCOTT	27.95	5367	4590	85/03/27	0	DE BURLO GROUP
MAYNARD	27.79	2885	2902	0	0	
HOLYOKE	27.07	24654	24964	85/12/06	0	Multiple Advisors
WORCESTER COUNTY	27.07	62490	60983	0	0	
READING	26.86	9313	9196	85/06/03	0	DE BURLO GROUP
ANDOVER	26.80	7994	7923	0	0	
ADAMS	26.32	3003	2863	0	0	
NATICK	25.80	12045	12422	85/03/14	0	UNITED INVESTMENT COUNCIL
GLOUCESTER	25.70	9621	9531	85/04/19	0	TUCKER ANTHONY MGMT. CO.
LEXINGTON	25.47	13127	12983	0	0	
ESSEX COUNTY	25.18	31372	29694	85/05/06	0	TUCKER ANTHONY MGMT. CO.
FALL RIVER	25.13	34742	33443	85/08/27	0	BAYBANK INC.
PLYMOUTH COUNTY	24.65	57584	57441	85/05/14	0	* MCLELLAN 50% Waiver
PITTSFIELD	24.07	20952	19760	86/12/08	0	Multiple Advisors
CHELSEA	24.05	11136	10660	0	0	
BELMONT	23.90	13099	13346	85/03/26	0	DE BURLO GROUP
SOUTHBRIDGE	23.89	2776	2672	0	0	
NORTH ADAMS	23.79	5163	5062	85/03/25	0	DE BURLO GROUP
NORFOLK COUNTY	23.78	63030	59614	0	85/11/01	PRIM BOARD
LAWRENCE	23.68	22779	22001	86/01/24	0	NATIONAL INVEST. SERVICES
STONEHAM	23.68	8779	8525	85/07/26	0	DAVID L. BABSON CO. INC.
LYNN	23.67	40550	34382	85/03/26	0	DE BURLO GROUP
TAUNTON	23.41	19959	15093	85/06/25	0	U.S. TRUST COMPANY
PEABODY	23.23	17973	17234	85/07/08	0	TUCKER ANTHONY MGMT. CO.
MIDDLESEX COUNTY	22.92	104452	102527	85/03/26	0	Multiple Advisors
BRAINTREE	22.89	14567	14420	85/04/01	0	* DREXEL BURNHAM LAMBERT
WINCHESTER	22.77	9221	9306	86/05/06	0	TUCKER ANTHONY & R.L.DAY
WELLESLEY	22.74	15219	15225	85/02/27	0	STANDISH, AYER & WOOD
DUKES COUNTY	22.70	3018	3014	0	0	
HAVERHILL	22.70	19357	17874	85/07/08	0	BOSTON COMPANY
MASS TURNPIKE AUTHORITY	22.68	31694	32717	0	0	
MILTON	22.54	10342	10097	0	86/07/01	PRIM BOARD
NEWTON	22.47	64695	67252	85/03/04	0	STANDISH, AYER & WOOD
EVERETT	22.43	15316	15368	85/02/15	0	BAYBANK INC.
BROCKTON	22.37	38367	39799	85/03/22	0	FORT HILL
HINGHAM	22.29	7264	7458	86/12/08	0	CONSTITUTION CAP.MGMT.
MALDEN	22.27	18073	18005	85/03/27	0	DE BURLO GROUP
WALTHAM	22.19	26242	25887	85/02/11	0	BAYBANK INC.
MASS. PORT AUTHORITY	22.17	40926	42518	85/02/07	0	THORNDIKE,DORAN,PAINE & LEWIS
NORTHAMPTON	22.07	7480	7304	85/04/18	0	DE BURLO GROUP
BERKSHIRE COUNTY	21.92	11711	11249	0	0	
MARBLEHEAD	21.90	10457	10070	85/04/03	0	DE BURLO GROUP
MARLBORO	21.90	8055	8027	0	0	

SYSTEM RANKING BY ANNUAL PERFORMANCE
Asset Value; Investment Management

PAGE TWO

TABLE # 1

SYSTEM	1985 TIME WEIGHTED RETURN	12/31/85 TOTAL ASSET VALUE (in \$000's)		DATE AUTHORIZED TO INVEST BEYOND THE STATUTORY "LEGAL LIST"		INVESTMENT ADVISOR
		BOOK	MARKET	BY WAIVER	JOINING PRIT	
FAIRHAVEN	21.53	2972	2986	0	86/07/01	PRIM BOARD
NEW BEDFORD	21.47	37157	35395	85/08/02	0	* SHAWMUT/BRISTOL COUNTY
BARNSTABLE COUNTY	21.15	36745	36557	0	0	
MELROSE	21.15	10272	10235	85/04/03	0	CONSTITUTION CAP.MGMT.
ARLINGTON	21.13	23559	24136	85/03/05	0	CONSTITUTION CAP.MGMT.
BRISTOL COUNTY	21.06	35391	35893	85/03/25	0	DE BURLO GROUP
EASTHAMPTON	20.95	3191	3067	85/04/12	0	NHAMP.SAV/WRIGHT INV.SRV
HAMPDEN COUNTY	20.79	27690	27688	85/04/11	0	* BOSTON COMPANY
BEVERLY	20.71	13122	12701	0	0	
SPRINGFIELD	20.45	61846	61887	85/05/06	0	BANK OF NEW ENGLAND-WEST
MEDFORD	20.34	19712	19146	85/03/14	0	CONSTITUTION CAP.MGMT.
WESTFIELD	20.28	12904	12618	85/04/04	0	BANK OF NEW ENGLAND-WEST
CHICOPEE	20.23	22443	23689	86/06/26	0	TUCKER ANTHONY MGMT.CO.
LOWELL	20.22	30278	29139	85/06/06	0	* Revoked 85/11/13
NEWBURYPORT	20.08	4664	4583	85/03/28	0	RICHARD MORSE INVEST. CO
METHUEN	20.03	8329	8164	86/10/16	0	DAVID L. BABSON CO.INC.
ATHOL	19.91	2105	2019	85/06/25	0	SHAWMUT/WORCESTER COUNTY
WATERTOWN	19.89	15147	13367	85/03/19	0	BOSTON COMPANY
ATTLEBORO	19.87	8521	8568	85/04/01	0	BAYBANK INC.
WAKEFIELD	19.75	9905	9786	0	85/07/01	PRIM BOARD
WEBSTER	19.71	2563	2504	0	0	
MILFORD	19.66	6259	6287	0	0	
LEOMINSTER	19.64	9048	8708	85/04/01	0	FIRST SAFETY FUND NATIONAL
NEEDHAM	19.58	19452	16821	85/03/12	85/07/01	* PRIM BOARD
SALEM	19.46	16701	15883	85/04/02	0	SHAWMUT BANK OF BOSTON
GARDNER	19.45	5450	5255	85/05/21	0	SHAWMUT BANK OF BOSTON
FRAMINGHAM	19.37	21651	20370	0	0	
NORTHBRIDGE	19.33	2158	2166	85/04/04	0	SHAWMUT/WORCESTER COUNTY
WORCESTER CITY	19.26	81932	76596	86/05/05	0	Multiple Advisors
DANVERS	19.14	13555	13737	85/04/03	0	RICHARD MORSE INVEST. CO
QUINCY	18.62	47047	44403	85/05/22	0	SOUTH SHORE BANK
AMESBURY	18.61	5256	5216	85/04/17	0	RICHARD MORSE INVEST. COUN.
WINTHROP	18.51	4494	4408	85/03/12	0	CONSTITUTION CAP.MGMT.
FALMOUTH	18.36	6139	6057	85/04/03	0	STATE STREET BANK & TRUST
FRANKLIN COUNTY	18.33	6680	6716	85/12/02	0	DE BURLO GROUP
NORTH ATTLEBORO	17.64	5499	5291	0	0	
SHREWSBURY	17.28	7089	6897	85/02/12	85/07/01	* PRIM BOARD
HULL	17.27	3288	3235	85/07/08	0	FORT HILL
GREENFIELD	17.24	4610	4535	86/07/29	0	BANK OF NEW ENGLAND-WEST
HAMPSHIRE COUNTY	17.18	18445	18321	85/04/11	0	BANK OF NEW ENGLAND-WEST
NORWOOD	17.18	15496	15835	85/03/05	0	CONSTITUTION CAP.MGMT.
CONCORD	16.77	7419	7286	86/05/21	0	Multiple Advisors
BROOKLINE	16.24	31007	29583	86/06/26	0	STATE STREET RESEARCH
WEST SPRINGFIELD	15.78	8870	8550	86/02/21	0	SHAWMUT FIRST BANK & TRUST
FITCHBURG	15.34	14376	13739	85/04/19	0	FIRST SAFETY FUND NATIONAL
SAUGUS	14.52	6206	5973	0	86/07/01	PRIM BOARD
REVERE	14.44	14196	13603	85/05/14	0	* FORT HILL 50% Waiver
MONTAGUE	13.27	2067	1974	86/03/05	86/07/01	* PRIM BOARD
MINUTEMAN REG.SCHOOL	13.17	760	774	0	85/07/01	PRIM BOARD
BLUE HILLS REG.SCHOOL	11.66	1484	1523	85/04/12	0	DAVID L. BABSON CO.INC.
MASS.HOUSING FIN.AGENCY	9.57	5534	5420	0	0	
GR. LAWRENCE SANIT.DIST.	7.68	1225	1211	86/07/29	0	ARLINGTON TRUST CO.

TABLE #1 SYSTEM RANKING BY ANNUAL PERFORMANCE

Table #1 indicates:

The time-weighted rate of return of each system listed with the top performing system first and the lowest performing system last;

The December 31, 1985 asset value of the system in thousands of dollars at both book value (as reported by the system on its Annual Statement for the year ending December 31, 1985, with fixed income investments valued at their original cost adjusted for an accretion of discount or amortization of premium as required by statute) and fair market value;

The date, if any, that the system was exempted from the statutory investment restrictions as authorized by Chapter 66I and/or the date the system joined the PRIT Fund; and

The Investment Advisors for all systems which were exempted from the statutory restrictions.

Measuring performance by time-weighting is the standard method by which the investment community compares performance. Time-weighting insulates performance calculations from the changes in portfolio value that occur because of the timing and amount of cash flow. Time-weighting thus allows the comparison of the performance of portfolios which differ in the timing of cash flows over which the manager who makes investment decisions has no control. This method allows a fair measurement of the effectiveness of the investment decisions of the fund manager.

Book values as of December 31, 1985 are listed for all funds except as follows:

The PRIT Fund, which is not subject to the statutory amortized book valuation;

The Norfolk County Retirement System for which an estimated book value as of October 31, 1985 has been utilized (available from an ongoing audit of that system conducted to complete its transfer into the PRIT Fund as of that date); and

The Teachers' Retirement System, which has not filed its 1985 statement of financial condition as of the date of this report.

Market values reflect the December 31, 1985 fair market value of each portfolio. (It should be noted that the valuation of the PRIT Fund includes the six local retirement systems which were participating in the pooled fund as of December 31, 1985.)

Following Table #1 is:

Appendix I-A describing certain data adjustments utilized in evaluating the performance of the systems listed in Table #1;

Appendix I-B explaining footnoted (*) listings for Investment Advisors, and listing the multiple advisors for systems having same;

Appendix I-C listing Investment Advisors managing three or more retirement systems; and

Appendix I-D indicating the number of systems receiving investment waivers or joining the PRIT Fund by month from October, 1984 to date.

Asset Growth

The market value of all assets held by the Massachusetts Contributory Retirement Systems as of December 31, 1985 was \$6,376,473,000.

By way of comparison, the most recent actuarial valuation completed for the Retirement Law Commission listed the total value of all public employee retirement system assets as of January 1, 1983 as \$3,886,645,000, and the actuarial valuation for the Retirement Law Commission previous to that listed these total assets as of January 1, 1979 as \$2,554,274,000.

Asset growth (including employee and employer contributions and investment returns) in the four years between the 1979 and 1983 valuations was at an annual compound rate of 11.1%.

In the three years since the January 1, 1983 valuation, the retirement system assets have grown at a compound annual rate of 17.9%.

The Four Largest Systems

<u>System</u>	<u>1985 Time Weighted Rate of Return</u>	<u>12/31/85 Book Value in \$000's</u>	<u>12/31/85 Market Value in \$000's</u>	<u>Date Exempted from Legal List Restrictions</u>
Boston	25.65%	521,338	549,105	2/21/85
State Employees	24.07%	1,304,586	1,365,884	12/20/83
Teachers'	24.00%	Not available	1,655,656	12/20/83
PRIT Fund	22.75%	Not applicable	1,069,660	12/20/83

If these systems were integrated in Table #1 (ranking systems by annual performance), the Boston Retirement System would be placed seventeenth; the State Employees' System, twenty-first; the Teachers' System, twenty-third; and the PRIT Fund, thirty-fifth.

Comparative Annual Performance

To evaluate the performance of the Massachusetts Systems compared to each other, to other public and private plans, and to standard investment indices, the following table lists the rate of return for the comparative standards described below and the ranking that such standard would receive if integrated with the 102 systems ranked in Table #1:

<u>Standard of Comparison</u>	<u>1985 Time-Weighted Rate of Return</u>	<u>Ranking</u>
SEI Associates Total Population Universe	25.4	18
SEI Local Government	23.9	23
SEI State Retirement	22.8	34
70/30 Composite Index	24.51	21
102 Unweighted Average	21.44	53
96 Aggregate	22.35	43
Aggregate Composite Index	20.16	65

SEI Associates Total The median performance of all balanced funds which are monitored by SEI:
90%
Population Universe: of which are corporate tax exempt funds, and the remaining 10% are state
and local government retirement systems, other trusts, profit sharing
plans and endowments.

SEI Local Governments: The median of 82 city and town retirement systems from across the country.

SEI State Retirement: The median of 25 state retirement funds from across the country.

70/30 Composite: Composite index consisting of 70% of Shearson Lehman Government/Corporate
Bond Index and 30% S&P 500 Stock Index which is similar to the basis of
the rate of return objective for each system established in PERA's
investment regulations. (The PERA regulation now utilizes the Salomon
Brothers High Grade Long Term Bond Index. In response to constructive
criticism, PERA is in the process of amending the regulation to use the
Shearson Lehman Government/Corporate Bond Index cited here. In 1985, the
Salomon Brothers Index was significantly higher than the Shearson Lehman
Index.)

102 Unweighted Average: An unweighted average of the rates of return of the 102 systems included
in Table #1.

96 Aggregate: The aggregate performance of all funds listed in the Table except for the
six funds participating in PRIT as of December 31, 1985.

Aggregate Composite
Index: A composite performance index including 10.69% of the S&P 500 Stock
Index, 71.49% of the Shearson Lehman Government/Corporate Bond Index, and
17.82% of the U. S. Treasury Bill Index, which represents the actual
average asset mix of the 96 aggregate system funds.

APPENDIX I-A

Data Adjustments

The data adjustments which were made on specific portfolios are as follows:

Athol: Cash as reported on the December, 1985 Trial Balance was \$45,000 greater than cash as reported on the Annual Statement for the year ending December 31, 1985. An unreconciled cash withdrawal was made for \$45,000.

Haverhill: Cash as reported on the December, 1985 Trial Balance was \$1,600 greater than cash as reported on the Annual Statement for the year ending December 31, 1985. An unreconciled cash withdrawal was made for \$1,600.

Gloucester: An unreconciled cash withdrawal was made for \$500. It should also be noted that cash as reported on different schedules in the Annual Statement for the year ending December 31, 1985 differs. This cash withdrawal was made assuming one of the two cash figures reported in the Annual Statement was correct.

Fall River: The Division was unable to gain sufficient investment information from the system to verify the actual income earned by each security. The Division had to assume that income in total as reported by the retirement system was correct. Absent verification procedures it is not possible for the Division to be certain as to the actual income earned. Additionally, accepting this assumption required that an unreconciled cash contribution of \$2,400 be made.

Fitchburg: An unreconciled cash withdrawal was made for \$208.

Milford: An unreconciled cash withdrawal was made for \$15,000.

Massachusetts Housing Finance Agency: Annual interest earned on cash equivalent investments was accounted for over 12 months. Interest was reinvested at year end.

Norfolk County: An unreconciled cash contribution was made for \$70,000.

APPENDIX I-B

Investment Advisor Footnotes (*) and Multiple Advisor Listings

Holyoke	Multiple Advisors	Tucker Anthony Management Company David L. Babson Company Inc. Internal--Ray DePeiteau Leonard Management Group
Plymouth County		(*) Received a partial waiver from the "legal list" restrictions allowing 50% of the portfolio to be invested under a "prudent man" standard rather than under the "legal list" limitations.
Pittsfield	Multiple Advisors	DeBurlo Group Internal--Lawrence A. Grizey, Jr.
Middlesex County	Multiple Advisors	Constitution Capital Management Boston Company Putnam Advisory Company
Braintree		(*) The system received its original "legal list" waiver on April 1, 1985 with the Shawmut Bank of Boston as investment advisor. On September 9, 1986 the system switched its investment advisor. Drexel, Burnham, Lambert has served Braintree as investment advisor since September 9, 1986.
New Bedford		(*) The system withdrew its waiver on October 9, 1986.
Hampden County		(*) The system received its original "legal list" waiver on April 11, 1985 with Rollert & Sullivan as its investment advisor. The waiver was revoked on July 31, 1985 when the system terminated its investment advisor. A new waiver was granted on August 16, 1985 with The Boston Company as investment advisor.
Lowell		(*) The "legal list" waiver was revoked on November 13, 1985.
Needham		(*) Received a "legal list" waiver with Fort Hill as the system's investment advisor, but transferred into the PRIT Fund on July 1, 1985.
Worcester City	Multiple Advisors	Trident Investment Management Frank Russell Trust Company Mechanics Bank
Shrewsbury		(*) Received a "legal list" waiver with Bay Banks as the system's investment advisor, but transferred into the PRIT Fund on July 1, 1985.
Concord	Multiple Advisors	Constitution Capital Management Frank Russell Trust Company
Revere		(*) Received a partial waiver from the "legal list" restrictions allowing 50% of the portfolio to be invested under a "prudent man" standard rather than under the "legal list" limitations.
Montague		(*) Received a "legal list" waiver with Gardner & Preston Moss, Inc. as investment advisor, but transferred into the PRIT Fund on July 1, 1986.
Boston	Multiple Advisors	Thorndike, Doran, Paine & Lewis Capital Bank Eagle Asset Management Boston Company Avatar Associates (Bear Stearns, Inc. - Application pending)

State/Teachers	Multiple Advisors	
	TMT	Colonial Advisory Services Eaton Vance Management Gardner & Preston Moss Hagler Mastrovita & Hewitt Independence Investment Associates Investco Capital Management One Federal Asset Management Rampart Investment Management Ruggels & O'Neill Associates Standish Ayer & Wood State Street Bank State Street Research & Management Stein Row & Farnham Thorndike Doran Paine & Lewis Trinity Investment Management Wells Fargo Investment Advisors First Chicago Investment Advisors Lendorff & Babson Aldrich Eastman & Wallich/State Street Bank Real Estate Fund Clayton & Dubilier Associates John Hancock Venture Capital Management TA Associates Vista Ventures
	TFIST	Endowment Management & Research Fiduciary Trust Company of NY Gardner & Preston Moss Miller Anderson Scerrerd Pacific Investment Management Company Standish Ayer & Wood State Street Research & Management Pension Investment Division of the State Treasury
PRIT Fund	Multiple Advisors	Alliance Capital Baring International Bear Stearns Boston Company Lazard Freres N. M. Rothschild Schroeder Capital Management Scudder, Stevens & Clark State Street International Trinity U. S. Trust Warburg Investment Wright Investors Endowment Management & Research Lehman Capital Lehman Index Plus One Federal Asset Management Putnam Capital Sass investors Internal-PRIM Board Staff

APPENDIX 1-C

Investment Advisors Managing Multiple Systems

<u>Investment Advisor</u>	<u>Number of Systems Managing</u>	<u>Systems Under Management</u>
DeBurlo Group	11	Bristol County North Adams Belmont Lynn Malden Swampscott Marblehead Northampton Reading Franklin County Pittsfield
PRIM Board	10	Weymouth Minuteman Regional School Needham Shrewsbury Wakefield Norfolk County Fairhaven Milton Montague Saugus
Constitution Capital Management	8	Arlington Norwood Winthrop Medford Melrose Concord Middlesex County Hingham
Tucker Anthony Management	6	Gloucester Essex County Peabody Winchester Chicopee Holyoke
Boston Company	5	Watertown Hampden County Haverhill Middlesex County Boston
Bank of New England West	4	Hampshire County Westfield Springfield Greenfield
BayBank	4	Waltham Everett Attleboro Fall River
David L. Babson Co., Inc.	4	Blue Hills Regional School Stoneham Methuen Holyoke

APPENDIX I-D

Legal List Waivers/PRIT Participation by Month

<u>Month</u>	<u>Number of Systems waived</u>	<u>Number Joining PRIT</u>	
December 1983	2		State Employees' and Teachers' systems waived from "legal list" by Chapter 661 of the Acts of 1983.
October 1984		1	
February 1985	6		One of which joined PRIT in July 1985.
March	17		One of which joined PRIT in July 1985.
April	18		
May	6		
June	4		One of which was revoked on November 13, 1985
July	4	4	
August	2		One of which was withdrawn on October 9, 1986
November		1	
December	2		
January 1986	1		
February	1		
March	1		This system joined PRIT in July 1986.
May	3		
June	2		
July	2	4	
October	1		
December	2		

As of this report:

67 systems	Are investing pursuant to a "legal list" waiver from PERA.
2 systems	Are investing pursuant to a statutory "legal list" waiver (State and Teachers' Systems).
10 systems	Are participating in PRIT.
2 systems	Were waived at one time but now are investing with "legal list" restrictions.
25 systems	Continue investing on the "legal list" standard.

1985

MASSACHUSETTS CONTRIBUTORY RETIREMENT SYSTEMS
INVESTMENT ANALYSIS REPORT

TABLE # 2

SYSTEM PERFORMANCE
Annual & By Quarter

PAGE ONE

SYSTEM	1985 TIME WEIGHTED RETURN	1985 QUARTERLY INVESTMENT RETURNS			
		FIRST	SECOND	THIRD	FOURTH
ADAMS	26.32	03.14	08.47	01.68	11.03
AMESBURY	18.61	01.94	06.25	00.80	08.65
ANDOVER	26.80	02.04	01.17	01.47	10.15
ARLINGTON	21.13	02.23	07.07	01.46	08.17
ATHOL	19.91	02.97	07.62	02.49	05.57
ATTLEBORO	19.87	02.63	08.02	01.20	06.84
BARNSTABLE COUNTY	21.15	02.26	07.72	02.06	07.76
BELMONT	23.90	01.93	08.40	01.04	10.96
BERKSHIRE COUNTY	21.92	02.72	08.20	02.09	07.45
BEVERLY	20.71	01.66	06.88	01.91	09.01
BLUE HILLS REG. SCHOOL	11.66	00.15	03.81	01.74	05.57
BRAINTREE	22.89	01.96	09.28	01.68	08.46
BRISTOL COUNTY	21.06	02.15	08.42	00.40	08.86
BROCKTON	22.37	03.67	09.47	00.11	07.95
BROOKLINE	16.24	02.12	06.42	01.70	05.17
CAMBRIDGE	31.97	02.02	11.69	01.72	13.85
CHELSEA	24.05	01.11	08.84	02.42	10.07
CHICOPEE	20.23	02.40	06.14	02.39	08.04
CLINTON	28.89	02.31	12.11	01.77	10.42
CONCORD	16.77	01.97	06.89	01.80	05.24
DANVERS	19.14	02.02	06.69	01.49	07.84
DEDHAM	27.95	00.16	00.69	00.07	26.76
DUKES COUNTY	22.70	00.78	08.70	01.68	10.14
EASTHAMPTON	20.95	02.54	06.48	01.02	09.65
ESSEX COUNTY	25.18	02.33	09.70	01.70	09.64
EVERETT	22.43	02.61	09.08	00.72	08.60
FAIRHAVEN	21.53	02.78	07.29	01.82	08.24
FALL RIVER	25.13	01.50	10.26	02.47	09.12
FALMOUTH	18.36	02.41	07.10	02.10	05.70
FITCHBURG	15.34	02.24	05.02	01.74	05.59
FRAMINGHAM	19.37	02.48	06.75	01.08	07.95
FRANKLIN COUNTY	18.33	01.98	06.59	02.85	05.85
GARDNER	19.45	01.16	08.23	01.50	07.49
GLOUCESTER	25.70	02.40	10.18	00.72	10.61
GR. LAWRENCE SANIT.DIST.	07.68	01.97	01.64	02.62	01.25
GREENFIELD	17.24	01.89	06.85	02.23	05.33
HAMPDEN COUNTY	20.79	02.05	07.59	02.54	07.28
HAMPSHIRE COUNTY	17.18	02.32	07.17	01.35	05.43
HAVERHILL	22.70	01.46	09.10	02.91	07.72
HINGHAM	22.29	02.13	07.65	02.00	09.04
HOLYOKE	27.07	02.82	11.38	02.52	08.92
HULL	17.27	02.20	05.98	01.53	06.65
LAWRENCE	23.68	02.07	09.14	02.53	08.28
LEOMINSTER	19.64	02.61	07.42	02.02	06.39
LEXINGTON	25.47	03.51	10.17	00.58	09.39
LOWELL	20.22	02.14	07.17	02.50	07.14
LYNN	23.67	01.86	08.61	01.00	10.67

TABLE # 2

SYSTEM PERFORMANCE
Annual & By Quarter

PAGE TWO

SYSTEM	1985 TIME WEIGHTED RETURN	1985 QUARTERLY INVESTMENT RETURNS			
		FIRST	SECOND	THIRD	FOURTH
MALDEN	22.27	02.03	07.76	01.44	09.63
MARBLEHEAD	21.90	02.41	07.80	00.06	10.36
MARLBORO	21.90	01.56	07.98	03.77	07.11
MASS TURNPIKE AUTHORITY	22.68	01.97	08.68	01.96	08.57
MASS. HOUSING FIN.AGENCY	09.57	02.38	02.52	02.17	02.18
MASS. PORT AUTHORITY	22.17	02.39	08.14	00.42	09.88
MAYNARD	27.79	03.27	11.23	01.72	09.38
MEDFORD	20.34	02.10	07.77	01.71	07.54
MELROSE	21.15	02.08	08.11	00.93	08.77
METHUEN	20.03	02.96	07.03	01.06	07.78
MIDDLESEX COUNTY	22.92	01.68	07.60	01.10	11.13
MILFORD	19.66	03.36	07.68	00.83	06.63
MILTON	22.54	02.14	09.09	01.90	07.92
MINUTEMAN REG. SCHOOL	13.17	02.69	02.09	01.16	09.22
MONTAGUE	13.27	02.37	04.14	01.85	04.33
NATICK	25.80	03.29	08.87	01.95	09.73
NEEDHAM	19.58	01.64	08.69	00.48	08.77
NEW BEDFORD	21.47	02.04	07.31	01.88	08.89
NEWBURYPORT	20.08	02.43	06.54	01.30	08.62
NEWTON	22.47	02.89	08.76	01.17	08.17
NORFOLK COUNTY	23.78	02.97	07.95	01.79	09.39
NORTH ADAMS	23.79	02.09	07.94	01.91	10.24
NORTH ATTLEBORO	17.64	01.52	07.68	01.85	05.66
NORTHAMPTON	22.07	01.85	07.61	01.17	10.09
NORTHBRIDGE	19.33	03.83	04.32	04.24	05.69
NORWOOD	17.18	01.68	06.29	01.59	06.72
PEABODY	23.23	01.98	09.12	02.34	08.20
PITTSFIELD	24.07	02.65	09.04	01.78	08.91
PLYMOUTH	28.43	02.19	11.49	02.02	10.50
PLYMOUTH COUNTY	24.65	01.86	09.70	02.33	09.75
QUINCY	18.62	02.05	07.04	02.02	06.44
READING	26.86	02.51	09.73	01.90	10.67
REVERE	14.44	03.33	04.85	00.51	05.09
SALEM	19.46	01.56	06.70	02.12	07.95
SAUGUS	14.52	01.63	05.40	01.43	05.41
SHREWSBURY	17.28	01.91	07.43	00.61	07.78
SOMERVILLE	29.93	02.09	09.73	01.57	14.20
SOUTHBRIDGE	23.89	02.80	08.39	02.32	08.68
SPRINGFIELD	20.45	02.88	08.29	00.50	07.58
STONEHAM	23.68	03.29	09.43	00.21	09.20
SWAMPSCOTT	27.95	02.40	09.78	00.89	12.81
TAUNTON	23.41	02.84	08.39	00.98	09.64
WAKEFIELD	19.75	02.05	07.77	00.17	08.71
WALTHAM	22.19	02.28	08.84	01.18	08.49
WATERTOWN	19.89	02.34	09.08	00.77	06.58
WEBSTER	19.71	01.01	07.49	01.58	08.54
WELLESLEY	22.74	02.19	08.26	00.47	10.42
WEST SPRINGFIELD	15.78	02.08	05.83	02.28	04.79
WESTFIELD	20.28	02.96	08.98	00.20	06.99
WEYMOUTH	28.18	10.16	08.41	00.55	07.93
WINCHESTER	22.77	01.76	08.89	02.37	08.23
WINTHROP	18.51	01.84	06.72	01.53	07.40
WOBURN	32.45	02.55	12.67	01.76	12.64
WORCESTER CITY	19.26	02.85	07.76	01.04	06.49
WORCESTER COUNTY	27.07	02.20	09.92	02.49	10.36

TABLE #2 SYSTEM PERFORMANCE BY QUARTER

Table #2 indicates:

The time-weighted rate of return of each system with the systems listed in alphabetical order; and
Quarterly investment returns for each system.

For retirement systems owning group annuity contracts and/or retirement plan funding agreements issued by insurance companies, such assets were carried at cost unless the system supplied PERA with December 31, 1985 market values for such contracts and/or agreements. Where market values were supplied, the performance for these contracts/agreements is noted in the fourth quarter. Depending on the magnitude of the contracts/agreements, retirement system performance will be understated in the first, second and third quarters and overstated in the fourth quarter as a result of this procedure.

The Dedham Retirement System, with 92% of its assets in contracts/agreement, had performance of 0.16% in the first quarter; 0.69% in the second quarter; 0.07% in the third quarter and 26.76% in the fourth quarter. The Dedham System's annual performance, however, is not affected materially by the timing of the market value reappraisal of the contracts/agreements. No other system approaches Dedham's commitment to group annuity contracts/retirement plan funding agreements.

Systems participating in the PRIT Fund receive an additional dividend for their investment by way of their proportionate share of a state appropriation pursuant to Chapter 32, s.22B of the General Laws. The result of this dividend in 1985 significantly increased the first quarter performance, and the total annual performance, of the Weymouth Retirement System. The other five systems joining the PRIT Fund in 1985 did not receive this participation dividend until Calendar Year 1986. Accordingly, their performance in 1985 is unaffected by any such dividend.

The Four Largest Systems

System	1985 Time Weighted Return	1985 Quarterly Investment Returns			
		First	Second	Third	Fourth
Boston	25.65	1.94	10.26	1.34	10.31
State Employees	24.07	3.06	8.81	1.00	9.57
Teachers'	24.00	2.99	8.85	1.13	9.38
The PRIT Fund	22.75	3.38	7.78	-1.04	11.33

Comparative Quarterly Performance

To evaluate the performance of the Massachusetts systems compared to each other, to other public and private plans and to standard investment indices, the following table lists the rate of return for the comparative standards described in the text preceding Table #1:

Standard of Comparison	1985 Time Weighted Return	1985 Quarterly Investment Returns			
		First	Second	Third	Fourth
SEI Associates Total Population Universe	25.4	6.27	7.37	-1.96	12.1
SEI Local Government	23.9	5.09	7.57	-0.64	10.3
SEI State Retirement	22.8	4.51	6.82	-0.18	10.2
70/30 Composite Index	24.51	4.25	7.99	.19	10.49
102 Unweighted Average	21.44	2.31	7.74	1.53	8.41
96 Aggregate	22.35	2.28	8.33	1.49	8.80
Aggregate Composite Index	20.16	2.87	7.09	1.34	7.61

1985

MASSACHUSETTS CONTRIBUTORY RETIREMENT SYSTEMS
INVESTMENT ANALYSIS REPORT

TABLE # 3

SYSTEM PERFORMANCE Annual;
By Asset Class; Asset Allocation

PAGE ONE

SYSTEM	1985 TIME WEIGHTED RETURN	EQUITY			FIXED INCOME		CASH	
		RETURN	BETA	ALLO- CATION	RETURN	ALLO- CATION	RETURN	ALLO- CATION
ADAMS	26.32	47.76	00.04	19.86	24.20	59.58	07.71	20.56
AMESBURY	18.61	56.37	01.01	10.41	19.56	66.22	06.52	23.38
ANDOVER	26.80	34.72	01.41	06.27	27.99	83.62	07.98	10.11
ARLINGTON	21.13	25.92	01.01	12.36	21.52	70.03	08.46	17.62
ATHOL	19.91	73.20	01.28	16.16	16.30	23.08	09.90	60.76
ATTLEBORO	19.87	41.66	01.05	08.69	19.52	81.70	07.37	09.61
BARNSTABLE COUNTY	21.15	33.89	01.18	02.31	22.70	84.94	11.37	12.75
BELMONT	23.90	29.05	01.38	10.76	23.22	82.73	14.64	06.51
BERKSHIRE COUNTY	21.92	57.52	00.70	06.24	23.98	65.00	08.71	28.76
BEVERLY	20.71	45.80	00.65	12.23	25.81	48.17	08.28	39.60
BLUE HILLS REG. SCHOOL	11.66	15.50	00.94	01.80	05.02	30.17	06.87	68.18
BRAINTREE	22.89	38.30	01.05	05.32	25.65	75.19	08.11	19.49
BRISTOL COUNTY	21.06	41.12	01.08	16.57	18.82	71.10	08.51	12.33
BROCKTON	22.37	36.61	01.07	15.35	22.92	68.73	07.01	15.91
BROOKLINE	16.24	61.14	01.03	02.64	18.77	64.07	07.93	33.29
CAMBRIDGE	31.97	52.44	00.84	27.26	26.74	69.35	08.32	03.39
CHELSEA	24.05	33.16	00.97	04.93	25.90	86.73	04.24	08.34
CHICOPEE	20.23	63.89	00.74	07.60	20.28	65.96	09.67	26.44
CLINTON	28.89	61.92	00.78	22.30	23.76	58.21	08.02	19.49
CONCORD	16.77	00.00	00.00	00.00	21.86	69.65	06.44	30.35
DANVERS	19.14	48.65	01.05	09.51	17.83	75.26	09.30	15.23
DEDHAM	27.95	14.74	00.00	01.48	28.11	89.22	01.53	09.30
DUKES COUNTY	22.70	53.66	00.71	13.83	22.07	50.62	09.37	35.55
EASTHAMPTON	20.95	48.55	01.27	14.85	24.78	49.08	11.67	36.06
ESSEX COUNTY	25.18	50.70	01.17	07.53	28.00	74.94	08.57	17.52
EVERETT	22.43	40.02	01.12	10.21	21.56	78.91	07.88	10.88
FAIRHAVEN	21.53	40.24	00.52	23.56	21.67	48.92	07.35	27.52
FALL RIVER	25.13	25.54	00.89	01.81	27.36	81.22	11.35	16.97
FALMOUTH	18.36	14.09	00.00	00.35	21.52	73.47	08.84	26.17
FITCHBURG	15.34	40.63	01.08	05.62	28.61	29.86	08.05	64.52
FRAMINGHAM	19.37	57.13	01.42	05.35	18.14	88.84	08.43	05.80
FRANKLIN COUNTY	18.33	16.27	01.44	03.33	19.75	84.58	06.12	12.09
GARDNER	19.45	23.71	01.03	06.03	24.16	61.66	09.10	32.32
GLOUCESTER	25.70	49.94	01.20	09.79	28.08	74.58	07.98	15.63
GR. LAWRENCE SANIT.DIST.	07.68	00.00	00.00	00.00	00.00	00.00	07.68	99.99
GREENFIELD	17.24	00.00	00.00	00.00	17.93	93.13	07.18	06.87
HAMPDEN COUNTY	20.79	77.84	01.18	09.68	18.17	68.17	08.28	22.15
HAMPSHIRE COUNTY	17.18	37.71	01.49	02.46	19.17	74.07	09.15	23.48
HAVERHILL	22.70	31.46	01.10	02.42	27.59	74.07	05.78	23.51
HINGHAM	22.29	52.78	00.74	04.35	22.67	79.56	08.52	16.10
HOLYOKE	27.07	86.47	00.50	14.76	23.64	63.73	07.39	21.51
HULL	17.27	45.61	00.97	07.57	23.43	52.58	06.44	39.84
LAWRENCE	23.68	20.27	00.17	02.93	24.90	88.78	08.06	08.29
LEOMINSTER	19.64	52.07	00.78	08.01	24.88	51.35	08.85	40.64
LEXINGTON	25.47	71.00	01.32	12.85	23.39	63.10	08.30	24.06
LOWELL	20.22	76.18	00.67	04.84	22.05	65.51	07.66	29.64
LYNN	23.67	35.38	01.07	13.55	22.78	80.78	07.83	05.67

TABLE # 3

SYSTEM PERFORMANCE Annual;
By Asset Class; Asset Allocation

PAGE TWO

SYSTEM	1985 TIME WEIGHTED RETURN	EQUITY			FIXED INCOME		CASH	
		RETURN	BETA	ALLO- CATION	RETURN	ALLO- CATION	RETURN	ALLO- CATION
MALDEN	22.27	37.32	01.30	11.47	20.43	78.42	09.25	10.11
MARBLEHEAD	21.90	44.81	01.25	16.96	18.06	74.91	12.10	08.13
MARLBORO	21.90	59.20	00.93	15.42	18.47	65.96	06.90	18.63
MASS TURNPIKE AUTHORITY	22.68	13.53	00.62	02.10	28.69	73.42	08.17	24.48
MASS. HOUSING FIN.AGENCY	09.57	00.00	00.00	00.00	14.65	06.15	09.25	93.85
MASS. PORT AUTHORITY	22.17	29.72	01.22	18.18	21.28	76.59	10.12	05.23
MAYNARD	27.79	55.48	00.77	28.53	20.61	45.69	10.03	25.78
MEDFORD	20.34	39.67	00.97	06.64	20.73	80.48	07.97	12.89
MELROSE	21.15	32.66	01.06	09.74	24.46	65.96	07.63	24.30
METHUEN	20.03	53.64	01.63	07.73	19.29	76.79	07.60	13.55
MIDDLESEX COUNTY	22.92	37.27	00.88	09.80	23.26	80.08	13.55	10.12
MILFORD	19.66	35.72	00.90	14.18	20.62	36.99	09.29	48.84
MILTON	22.54	61.71	01.49	01.94	25.43	80.68	05.75	17.38
MINUTEMAN REG. SCHOOL	13.17	08.60	00.00	60.37	00.00	00.00	08.51	39.63
MONTAGUE	13.27	37.84	00.77	02.33	15.13	64.81	08.13	32.87
NATICK	25.80	56.38	00.85	20.15	21.79	62.35	07.19	17.50
NEEDHAM	19.58	31.24	00.00	43.39	26.86	42.81	08.75	13.79
NEW BEDFORD	21.47	47.90	01.01	11.41	26.40	51.34	06.79	37.25
NEWBURYPORT	20.08	61.43	00.98	10.30	21.39	62.59	09.17	27.11
NEWTON	22.47	41.52	01.14	09.67	23.39	78.36	07.21	13.91
NORFOLK COUNTY	23.78	51.58	00.00	29.72	26.06	39.44	06.55	30.84
NORTH ADAMS	23.79	48.54	01.12	13.55	22.91	62.19	10.16	24.25
NORTH ATTLEBORO	17.64	34.11	00.12	11.41	19.20	68.18	09.62	20.40
NORTHAMPTON	22.07	38.11	01.04	21.06	18.25	59.68	13.87	19.26
NORTHBRIDGE	19.33	35.59	01.16	14.54	27.37	39.30	08.81	46.16
NORWOOD	17.18	33.48	00.89	05.09	19.26	72.78	08.17	22.13
PEABODY	23.23	56.92	01.09	02.82	25.22	83.01	06.95	14.17
PITTSFIELD	24.07	50.60	00.77	10.20	23.11	71.16	10.12	18.65
PLYMOUTH	28.43	69.08	01.64	04.32	27.18	92.69	02.35	03.00
PLYMOUTH COUNTY	24.65	46.16	00.79	09.55	25.50	73.64	08.67	16.81
QUINCY	18.62	48.28	01.15	03.87	19.52	84.18	07.44	11.95
READING	26.86	45.38	00.77	09.22	25.65	76.77	11.09	15.04
REVERE	14.44	43.99	01.19	09.59	25.50	20.47	08.37	69.93
SALEM	19.46	23.91	01.03	02.71	26.60	61.51	08.71	35.77
SAUGUS	14.52	00.00	00.00	00.00	27.43	38.32	06.45	61.68
SHREWSBURY	17.28	25.65	00.00	52.54	15.04	25.44	06.35	22.02
SOMERVILLE	29.93	54.31	00.87	39.40	23.89	33.96	08.32	26.64
SOUTHBRIDGE	23.89	64.88	00.85	06.49	23.42	83.41	05.90	10.10
SPRINGFIELD	20.45	52.46	01.21	12.18	20.43	62.87	06.75	24.94
STONEHAM	23.68	48.15	01.24	14.96	25.29	59.53	08.79	25.50
SWAMPSCOTT	27.95	55.28	01.25	25.80	20.79	53.42	13.01	20.68
TAUNTON	23.41	41.59	01.06	14.87	24.22	75.12	10.58	10.01
WAKEFIELD	19.75	28.80	00.00	37.31	25.61	42.13	07.93	20.54
WALTHAM	22.19	39.61	01.09	07.63	21.37	86.85	11.00	05.52
WATERTOWN	19.89	24.86	01.37	16.42	20.24	68.69	07.35	14.89
WEBSTER	19.71	54.58	00.70	19.04	13.09	53.62	04.14	27.34
WELLESLEY	22.74	23.57	01.14	23.44	23.75	70.95	12.61	05.61
WEST SPRINGFIELD	15.78	00.00	00.00	00.00	16.90	82.46	08.12	17.54
WESTFIELD	20.28	38.03	01.19	11.36	22.30	63.68	08.80	24.86
WEYMOUTH	28.18	29.75	00.00	90.21	00.00	00.00	07.43	09.79
WINCHESTER	22.77	63.39	00.63	04.25	25.63	72.46	08.49	23.30
WINTHROP	18.51	09.89	00.93	03.97	22.01	75.44	05.78	20.58
WOBURN	32.45	70.40	00.79	11.78	29.78	82.65	06.24	05.57
WORCESTER CITY	19.26	46.46	00.90	10.98	17.37	77.27	08.75	11.75
WORCESTER COUNTY	27.07	54.77	00.68	16.09	23.40	76.80	09.42	07.11

TABLE #3 SYSTEM PERFORMANCE BY ASSET CLASS

Table #3 indicates:

The time-weighted rate of return of each system listed in alphabetical order;

The annual return on the equity portion of the retirement systems portfolio which includes common and preferred stock;

The December 31, 1985 Beta for the equity portion of the retirement systems portfolio;
(Beta is an investment concept which evolved from linear regression analysis, where it measures the slope of expected values, or rather, the percentage volatility of a particular stock. This measure examines the riskiness of an individual stock by comparing its price volatility with that of the overall market. In this analysis, a Beta factor of 1.0 is assigned to the S&P 500 Index, and the price volatility of individual stocks relative to the overall market price fluctuations of the index determines the Beta of the individual security. Thus, if the price movements on a day-to-day basis for a given stock are 50% wider than the S&P 500 Stock Index price movements, the individual stock's Beta would be 1.5. On the other hand, a lower volatility stock might have a market Beta of 0.75, meaning its day-to-day price movement is only three-quarters that of the overall market index. Investment theories suggest that risk is compensated by higher returns; and that over time, high Beta stocks should be rewarded by higher returns. With the potential for higher returns, however, comes the higher risk, particularly in down markets. PERA's investment regulation requires that systems exempt from the "legal list" not exceed an annual average Beta of 1.15 for the equity portion of the board's portfolio.)

The weighted average percentage of the retirement system portfolio invested in equities during 1985;

The annual return on the fixed income portion of the portfolio which includes all fixed income securities and group annuity contracts/retirement plan funding agreements;

The weighted average percentage of the portfolio committed to fixed income securities and group annuity contracts/retirement plan funding agreements during 1985;

The annual return on cash which includes cash and cash equivalent investments; and

The weighted average percentage of the retirement system portfolio committed to cash during 1985.

The asset allocation for retirement systems continuing to operate within the statutory "legal list" allows such systems to invest:

In Fixed income obligations of the U. S. Government and its agencies;

Up to 20% in fixed income obligations of railroad corporations;

Up to 35% in fixed income obligations of telephone companies;

Up to 50% in the fixed income obligations of public service companies;

Up to 15% in fixed income obligations of other corporations;

Up to 25% in equities of bank and insurance companies;

In money market funds;

In certificates of deposit; and

In group annuity contracts and/or retirement plan funding agreements issued by insurance companies.

Retirement systems which have been authorized by PERA to invest without being subjected to the "legal list" restrictions, must meet asset allocation guidelines set by PERA as follows:

Up to 40% in Equity investments;

75% of Equity investments must be in companies with \$100 Million in outstanding equity. Not more than 5% of Equity investments may be in any one company;

Equities must be traded on U. S. Stock Exchange or over the counter;

Turnover of the Equity portfolio is limited to 50% per year;

The Four Largest Systems

System	1985 Time Weighted Return	Equity Performance		Fixed Income Performance		Cash Performance	
		Return	Allo- cation	Return	Allo- cation	Return	Allo- cation
Boston	25.65	38.55	9.35	24.12	81.95	8.91	8.70
State Employees/Teachers	24.07/24.00	25.69	*	24.94	*	*	*
The PRIT Fund	22.75	28.46	35.11	25.28	48.97	8.27	15.92

* The State Employees' and Teachers' Retirement Systems are invested in a fixed income (Treasurers Fixed Income Securities Trust) and an equity (Treasurers Management Trust) trust. As these systems were not fully integrated in PERA's monitoring data base, we do not have reliable asset allocation or cash performance figures. (We do have such details for the two trusts for regulatory purposes, but integration of the two retirement system holdings of trust units will not be brought within this reporting structure until Calendar 1986 performance is analyzed.)

The asset mix for the Boston Retirement System is a weighted average asset mix between May and July 1985 rather than the December 31, 1984 through December 31, 1985 weighted average utilized for other systems.

Comparative Asset Class Performance

To evaluate the performance of the Massachusetts systems compared to each other, to other public and private plans, and to standard investment indices, the following table lists the rate of return by asset class for the comparative standards described in the text preceding Table #1:

Standard of Comparison	Time-Weighted Rate of Return	Equity Return	Fixed Income Return	Cash Return
SEI Associates Total Population Universe	25.4	32.9	21.3	-
SEI Local Government	23.9	33.3	21.9	-
SEI State Retirement	22.8	29.0	22.2	-
S&P 500	-	31.95	-	-
Shearson/Lehman Bond Index	-	-	21.33	-
Treasury Bill Index	-	-	-	8.35
102 Unweighted Average	21.44	41.16	21.77	8.32
96 Aggregate	22.35	46.23	22.70	8.30

Comparative Asset Allocation

To help compare the asset allocation decision of the retirement systems the following indicates the allocation for an unweighted average for 102 systems and for the aggregate of the 96 systems as described in the text preceding Table #1:

Standard of Comparison	Equity Allocation	Fixed Income Allocation	Cash Allocation
102 Unweighted Average	12.47	64.06	23.46
96 Aggregate	10.69	71.49	17.82

It should be noted that systems holding significant percentages of their portfolio in cash or cash equivalents materially underperformed those who were fully invested in bonds and stocks. Further, the Massachusetts Retirement Systems had exceptionally strong equity performance. The "legal list" limitation to bank and insurance stocks fortuitously placed the systems in an unusually well performing sector within the equity market. The Keefe, Bruyette and Woods Bank Index (which includes the stocks of money center institutions and large regional banks) showed a 1985 return of 35.35% (which is 10% greater than the S&P 500 Index). Smaller regional bank stocks may have performed even better, particularly as they became the targets of takeovers.

Real estate Investments are included within the 40% of the portfolio committed to Equity and may not exceed 5% of the portfolio; and

Venture Capital falls within the 40% allocation to Equity and is limited to 3 or 5% of the portfolio depending on the size of the retirement system.

Between 40 and 80% of the portfolio is to be allocated to Fixed Income Investments:

Fixed Income securities must have a minimum quality rating of BAA;

75% of Fixed Income securities must be rated A or better;

No more than 5% of the portfolio may be invested in the Fixed Income obligations of any one company;

Fixed Income Investments shall only be made in issues with an outstanding par value of \$50 Million at the time of purchase; and

Turnover of Fixed Income Investments is limited to 100%.

Up to 40% of the portfolio in Cash and Cash Equivalent Investments:

Money market funds;

Commercial paper;

Certificates of deposit; and

Repurchase agreements.

Systems joining the PRIT Fund hold shares of the PRIT Fund (which are treated as equities in PERA's monitoring system) and cash and cash equivalent investments authorized under the statutory "legal list".

As indicated in Appendix I-D, the majority of retirement systems (holding over 92% of Massachusetts public employee retirement system assets) are invested free of the statutory "legal list". This development resulted in a significant restructuring of pension system portfolios during 1985 and continuing into 1986. If we differentiate systems between those freed of the "legal list" before July 31, 1985 and all others, we can see this restructuring (from Fixed Income into Equities) in the following chart:

	ASSET ALLOCATION		
	<u>Fixed Income</u>	<u>Equities</u>	<u>Cash</u>
Systems Waived prior to 7/31/85			
December 31, 1984	75.27	5.54	19.20
December 31, 1985	66.97	15.47	17.93
Other Systems			
December 31, 1984	69.81	8.65	21.54
December 31, 1985	69.49	12.87	17.64

Equity Beta's for the six systems participating in PRIT as of December 31, 1985 appear in Table #3 as 00.00 because PERA lacks the necessary historical data for PRIT units (as this is a newly created fund) to match the units volatility against the market index. The Dedham and Falmouth Retirement Systems are listed in Table #3 with a Beta of 00.00 because neither system held any equities as of December 31, 1985 (the listed asset allocation being a weighted average of portfolio holdings over the entire year; unlike the Beta calculation which is for holdings as of December 31, 1985).

The Somerville Retirement System, investing pursuant to the "legal list" exceeded the permissible holdings in equities. That system is currently taking corrective action and anticipates being in compliance with the "legal list" investment requirements on or before December 31, 1986.

1985

MASSACHUSETTS CONTRIBUTORY RETIREMENT SYSTEMS
INVESTMENT ANALYSIS REPORT

TABLE # 4		SYSTEM PERFORMANCE Time Weighted; Dollar Weighted; Transaction Activity				PAGE ONE	

SYSTEM	1985 TIME WEIGHTED RETURN	1985 DOLLAR WEIGHTED RETURN	1985 PURCHASE ACTIVITY		1985 SALES ACTIVITY		
			TOTAL PURCHASES (in \$000's)	AS A % OF MARKET VALUE	TOTAL SALES (in \$000's)	AS S % OF MARKET VALUE	
ADAMS	26.32	26.71	2100	73.34	2144	74.88	
AMESBURY	18.61	19.06	1327	25.44	994	19.05	
ANDOVER	26.80	26.92	1604	20.24	577	7.28	
ARLINGTON	21.13	20.23	9251	38.32	4541	18.81	
ATHOL	19.91	19.85	2360	116.88	2497	123.67	
ATTLEBORO	19.87	19.87	6001	70.03	5032	58.73	
BARNSTABLE COUNTY	21.15	21.18	8208	22.45	3990	10.91	
BELMONT	23.90	24.02	7582	56.81	5049	37.83	
BERKSHIRE COUNTY	21.92	22.00	4523	40.20	3887	34.55	
BEVERLY	20.71	20.91	44206	348.05	44977	354.12	
BLUE HILLS REG. SCHOOL	11.66	11.73	981	64.41	6	0.39	
BRAINTREE	22.89	22.98	7901	54.79	6574	45.58	
BRISTOL COUNTY	21.06	21.17	24329	67.78	17307	48.21	
BROCKTON	22.37	22.53	9715	24.41	6687	16.80	
BROOKLINE	16.24	16.29	6000	20.28	10427	35.24	
CAMBRIDGE	31.97	32.20	27761	38.30	21266	29.33	
CHELSEA	24.05	24.13	4891	45.88	3676	34.48	
CHICOPEE	20.23	20.30	5538	23.37	6426	27.12	
CLINTON	28.89	28.84	3747	114.27	3513	107.13	
CONCORD	16.77	16.72	0	0.00	589	8.08	
DANVERS	19.14	19.17	5700	41.49	1270	9.24	
DEDHAM	27.95	27.46	1000	14.31	282	4.03	
DUKES COUNTY	22.70	22.70	1829	60.68	1500	49.76	
EASTHAMPTON	20.95	21.11	1525	49.72	882	28.75	
ESSEX COUNTY	25.18	25.20	6575	22.14	5145	17.32	
EVERETT	22.43	22.28	12149	79.05	9633	62.68	
FAIRHAVEN	21.53	21.50	2972	99.53	2854	95.57	
FALL RIVER	25.13	25.24	38157	114.09	34620	103.51	
FALMOUTH	18.36	18.36	3311	54.66	1758	29.02	
FITCHBURG	15.34	15.55	12843	93.47	16242	118.21	
FRAMINGHAM	19.37	19.39	6032	29.61	2935	14.40	
FRANKLIN COUNTY	18.33	18.38	2296	34.18	1181	17.58	
GARDNER	19.45	19.51	644	12.25	312	5.93	
GLOUCESTER	25.70	25.80	3233	33.92	2835	29.74	
GR. LAWRENCE SANIT.DIST.	07.68	07.67	3522	290.83	2357	194.63	
GREENFIELD	17.24	17.25	1290	28.44	802	17.68	
HAMPDEN COUNTY	20.79	20.85	22980	82.99	22994	83.04	
HAMPSHIRE COUNTY	17.18	17.17	6614	36.10	4911	26.80	
HAVERHILL	22.70	22.78	15624	87.41	14229	79.60	
HINGHAM	22.29	22.27	1758	23.57	814	10.91	
HOLYOKE	27.07	27.88	8449	33.84	13078	52.38	
HULL	17.27	17.32	1110	34.31	1120	34.62	
LAWRENCE	23.68	23.75	5115	23.24	2447	11.12	
LEOMINSTER	19.64	19.76	6750	77.51	4893	56.18	
LEXINGTON	25.47	25.50	2057	15.84	248	1.91	
LOWELL	20.22	20.26	86329	296.26	83421	286.28	
LYNN	23.67	23.92	31486	91.57	24882	72.36	

TABLE # 4

SYSTEM PERFORMANCE Time Weighted;
Dollar Weighted; Transaction Activity

PAGE TWO

SYSTEM	1985 TIME WEIGHTED RETURN	1985 DOLLAR WEIGHTED RETURN	1985 PURCHASE ACTIVITY		1985 SALES ACTIVITY	
			TOTAL PURCHASES (in \$000's)	AS A % OF MARKET VALUE	TOTAL SALES (in \$000's)	AS S % OF MARKET VALUE
MALDEN	22.27	22.30	14509	80.58	13011	72.26
MARBLEHEAD	21.90	22.09	8155	80.98	4590	45.58
MARLBORO	21.90	21.99	3501	43.61	2474	30.82
MASS TURNPIKE AUTHORITY	22.68	22.81	4939	15.09	2341	7.15
MASS. HOUSING FINANCE	09.57	09.55	1003	18.50	200	3.69
MASS. PORT AUTHORITY	22.17	22.24	21092	49.60	15303	35.99
MAYNARD	27.79	27.81	1554	53.54	1538	52.99
MEDFORD	20.34	20.41	4357	22.75	2091	10.92
MELROSE	21.15	21.24	2087	20.39	1013	9.89
METHUEN	20.03	20.07	2701	33.08	1227	15.02
MIDDLESEX COUNTY	22.92	23.09	67274	65.61	55509	54.14
MILFORD	19.66	19.91	5474	87.06	5289	84.12
MILTON	22.54	22.54	1605	15.89	1039	10.29
MINUTEMAN REG. SCHOOL	13.17	13.69	696	89.92	30	3.87
MONTAGUE	13.27	13.31	804	40.72	350	17.73
NATICK	25.80	25.91	6554	52.76	4483	36.08
NEEDHAM	19.58	20.10	19031	113.13	13491	80.20
NEW BEDFORD	21.47	21.63	120159	339.48	115538	326.42
NEWBURYPORT	20.08	20.26	1124	24.52	639	13.94
NEWTON	22.47	22.48	29471	43.82	27075	40.25
NORFOLK COUNTY	23.78	23.67	50211	84.22	37946	63.65
NORTH ADAMS	23.79	23.89	3780	74.67	2472	48.83
NORTH ATTLEBORO	17.64	17.60	2980	56.32	1508	28.50
NORTHAMPTON	22.07	22.04	6932	94.90	4734	64.81
NORTHBRIDGE	19.33	19.45	5396	249.12	5406	249.58
NORWOOD	17.18	17.34	4210	26.58	1690	10.67
PEABODY	23.23	23.22	3596	20.86	3748	21.74
PITTSFIELD	24.07	24.21	7092	35.89	5511	27.88
PLYMOUTH	28.43	28.36	1327	12.57	1341	12.70
PLYMOUTH COUNTY	24.65	24.80	32762	57.03	25164	43.80
QUINCY	18.62	18.62	12779	28.77	9505	21.40
READING	26.86	26.98	3747	40.74	1804	19.61
REVERE	14.44	14.41	7311	53.74	6609	48.58
SALEM	19.46	19.56	7366	46.37	4283	26.96
SAUGUS	14.52	14.53	8535	142.89	7788	130.38
SHREWSBURY	17.28	17.49	6182	89.63	5444	78.93
SOMERVILLE	29.93	30.06	25721	88.36	22903	78.68
SOUTHBRIDGE	23.89	23.58	387	14.48	432	16.16
SPRINGFIELD	20.45	20.44	13016	21.03	23879	38.58
STONEHAM	23.68	23.88	3445	40.41	1170	13.72
SWAMPSCOTT	27.95	27.90	2652	57.77	1685	36.71
TAUNTON	23.41	23.41	5529	36.63	3051	20.21
WAKEFIELD	19.75	19.76	10133	103.54	8835	90.28
WALTHAM	22.19	22.23	17920	69.22	14479	55.93
WATERTOWN	19.89	19.89	11387	85.18	10330	77.27
WEBSTER	19.71	19.60	1303	52.03	921	36.78
WELLESLEY	22.74	23.10	21533	141.43	18680	122.69
WEST SPRINGFIELD	15.78	15.77	5847	68.38	5565	65.08
WESTFIELD	20.28	20.30	3657	28.98	4242	33.61
WEYMOUTH	28.18	28.68	6037	44.96	8480	63.16
WINCHESTER	22.77	22.86	1794	19.27	299	3.21
WINTHROP	18.51	18.40	1009	22.89	402	9.11
WOBURN	32.45	32.42	1985	16.89	1129	9.60
WORCESTER CITY	19.26	19.29	20407	26.64	11409	14.89
WORCESTER COUNTY	27.07	27.20	19218	31.51	8141	13.34

TABLE #4 TIME/DOLLAR WEIGHTED RETURNS; TRANSACTION ACTIVITY

Table #4 indicates:

The time-weighted rate of return of each system listed in alphabetical order;

The dollar-weighted rate of return of each retirement system;

(A dollar-weighted rate of return, also referred to as an internal rate of return, is a measure of the fund's actual change in value, unadjusted for the timing of cash flows and other factors which affect total fund value. The dollar-weighted rate of return summarizes the growth rate of the assets rather than the performance of the investment manager, and is helpful in assessing the adequacy of the total fund to meet its obligations. The dollar-weighted rate of return is the investment standard to be compared to the interest assumption used in actuarial valuations determining the retirement systems liabilities and full funding schedules.)

The dollar value in thousands of all investment purchases made by the retirement system during 1985

(this would include the rollover of certificates of deposit as the sale of the expiring CD and the purchase of a new CD)

The percentage of December 31, 1985 retirement system asset market value represented by the total purchases during the year;

(Systems with large cash positions and frequent rollover of CD's will show high values for this item in Table #4; systems joining the PRIT Fund during 1985 will be seen to have liquidated their entire portfolio and purchased its full value in PRIT units, thus also appearing to have high activity in this item in Table #4)

The dollar value in thousands of all sales of retirement system investments during 1985 (with the same caveat noted for total purchases above); and

The percentage of December 31, 1985 retirement system asset market value represented by the total sale of investments during the year (with the same caveats noted above for purchases as a percentage of market value).

The information in Table #4 gives an indication as to whether the retirement system maintained an active or passive investment style. While the impact of cash and cash equivalent activity tends to inflate the figures presented, they remain a reasonable indication of the level of investment activity for the systems.

There are no uniform standards to which this information can be compared but we note that the unweighted average of the 102 systems within PERA's monitoring process had a purchase ratio of 63.73% and a sales ratio of 51.50%.

We do not have purchase/sales activity information for the State Employees', Teachers', Boston and PRIT Fund portfolios, because they were not fully integrated in PERA's monitoring system. We anticipate providing such information when analyzing Calendar 1986 performance.

The dollar weighted rate of return for an unweighted average of the 102 systems within PERA's monitoring system was 21.51%.

For the 96 Aggregate systems described in the text preceding Table #1, the dollar weighted return in 1985 was 22.43%.

These dollar weighted rates of return compare with an actuarial interest assumption of 7.5% in the most recent Retirement Law Commission study (as of January 1, 1983), and an actuarial interest assumption of 8.0% in the development of the Pension Funding and Reform legislation filed by Governor Dukakis in February, 1985 (pending with a House-Senate Conference Committee at this writing).

1985

MASSACHUSETTS CONTRIBUTORY RETIREMENT SYSTEMS
INVESTMENT ANALYSIS REPORT

SYSTEM RANKING BY SELECTED CRITERIA

TABLE # 5A

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SYSTEM	1985 TIME WEIGHTED RETURN	12/31 ASSET MARKET VALUE	1985 RETURN BY ASSET TYPE			1985 ASSET ALLOCATION			DOLLAR WEIGHT- ED RETURN	TRANSACTION ACTIVITY AS % OF ASSETS		1985 QUARTERLY RETURNS			
			EQUITY	FIXED INCOME	CASH	EQUITY	FIXED INCOME	CASH		PURCHASES	SALES	FIRST	SECOND	THIRD	FOURTH
ADAMS	14	94	42	34	67	16	74	49	14	30	21	10	36	54	7
AMESBURY	82	82	20	76	88	46	56	41	81	77	68	78	88	83	45
ANDOVER	13	69	70	7	61	68	11	82	13	91	94	67	101	62	18
ARLINGTON	55	25	82	63	44	36	49	57	65	60	69	48	73	63	56
ATHOL	67	98	4	94	17	22	97	7	71	8	7	12	61	11	91
ATTLEBORO	69	64	50	77	75	59	17	87	70	31	29	25	48	68	78
BARNSTABLE CO.	53	12	72	52	8	90	8	75	54	85	86	46	57	25	67
BELMONT	23	47	80	47	1	45	14	94	23	40	44	79	39	75	8
BERKSHIRE CO.	48	53	16	36	37	69	61	24	49	59	51	22	45	24	72
BEVERLY	59	49	45	19	50	37	85	13	57	1	1	89	77	33	36
BLUE HILLS	100	100	91	99	84	94	94	4	100	36	102	102	97	46	92
BRAINTREE	33	41	59	20	56	73	34	52	34	42	40	77	18	52	51
BRISTOL COUN	56	13	53	83	41	20	47	76	55	34	38	53	37	94	40
BROCKTON	42	11	66	49	81	25	52	65	40	79	74	3	16	100	61
BROOKLINE	93	19	14	84	64	86	63	18	93	90	49	57	86	51	97
CAMBRIDGE	2	3	30	14	47	9	51	101	2	61	56	70	3	47	3
CHELSEA	22	54	74	18	99	75	7	89	22	51	52	98	30	13	21
CHICOPEE	63	26	9	73	18	63	59	29	61	81	61	37	89	14	58
CLINTON	4	88	11	38	59	13	76	53	4	9	10	44	2	43	13
CONCORD	92	72	97	58	91	97	50	22	92	102	93	75	76	40	96
DANVERS	80	43	36	91	22	57	33	67	80	55	91	71	82	61	64
DEDHAM	7	73	92	4	102	95	3	88	10	99	97	101	102	98	1
DUKES COUNTY	37	91	26	55	21	32	82	17	38	37	35	100	32	53	19
EASTHAMPTON	57	90	37	31	7	28	83	15	56	48	58	29	85	77	25
ESSEX COUNTY	18	18	33	6	39	65	36	59	19	86	73	42	14	50	26
EVERETT	41	38	56	61	65	48	24	80	43	27	28	26	23	86	47
FAIRHAVEN	51	92	55	60	76	11	84	25	52	13	12	21	69	39	53
FALL RIVER	19	16	84	11	9	93	18	62	18	10	11	95	7	12	34
FALMOUTH	84	77	93	62	30	96	42	30	85	43	57	34	72	23	87
FITCHBURG	95	42	54	3	58	71	95	5	95	15	9	47	93	45	90
FRAMINGHAM	77	28	17	88	45	72	4	95	78	71	78	31	79	73	60
FRANKLIN COUNTY	85	75	90	75	94	82	9	77	84	66	72	73	83	4	86

SYSTEM RANKING BY SELECTED CRITERIA

TABLE # 5A

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SYSTEM	1985	12/31	1985			1985			DOLLAR	TRANSACTION		1985			
	TIME	ASSET	RETURN	BY	TYPE	ASSET	ALLOCATION	WEIGHT-		ACTIVITY	AS % OF ASSETS	QUARTERLY RETURNS			
	WEIGHTED	MARKET	EQUITY	FIXED	CASH	EQUITY	INCOME	CASH		ED		PURCHASES	SALES	FIRST	SECOND
RETURN	VALUE								RETURN						
GARDNER	76	81	87	35	28	70	71	20	76	101	96	97	44	60	71
GLOUCESTER	16	60	35	5	60	51	38	66	16	67	55	36	8	85	11
GR. LAWRENCE	102	101	97	100	68	97	100	1	102	4	5	76	100	5	102
GREENFIELD	89	86	97	90	80	97	1	93	90	74	71	81	78	20	95
HAMPDEN COUNTY	58	22	2	87	51	53	55	43	58	24	15	64	64	6	74
HAMPSHIRE CO.	90	31	63	82	27	87	39	40	91	63	63	43	70	66	93
HAVERHILL	36	33	76	8	96	88	40	39	37	20	17	96	21	3	68
HINGHAM	43	70	28	53	40	77	23	64	44	80	85	56	60	29	35
HOLYOKE	11	24	1	40	74	29	64	46	8	68	34	19	5	8	37
HULL	88	89	46	41	90	64	79	11	89	65	50	50	90	59	80
LAWRENCE	27	27	89	29	57	83	5	90	27	82	83	63	19	7	52
LEOMINSTER	73	63	31	30	29	60	80	10	72	28	30	27	67	27	85
LEXINGTON	17	48	5	45	49	35	66	38	17	96	101	4	9	88	30
LOWELL	64	20	3	56	69	76	60	23	63	3	3	55	71	9	75
LYNN	29	15	69	51	66	34	19	96	24	16	22	83	35	78	10
MALDEN	44	32	64	71	24	40	25	83	42	26	23	69	56	64	28
MARBLEHEAD	49	58	48	89	6	19	37	91	47	25	39	33	52	99	16
MARLBORO	50	68	15	85	83	24	57	56	50	54	54	92	49	2	76
MASS TURNPIKE	38	17	94	2	52	91	43	35	36	97	95	74	34	30	48
MHFA	101	79	97	97	25	97	99	2	101	93	99	39	98	21	101
MASSPORT	46	10	79	66	15	18	31	100	45	49	48	38	46	93	22
MAYNARD	9	93	21	70	16	8	86	31	9	45	33	9	6	48	31
MEDFORD	61	30	57	68	62	66	21	74	60	84	84	58	53	49	70
MELROSE	54	56	75	32	70	52	58	36	53	89	89	61	47	80	41
METHUEN	66	67	27	79	71	61	29	73	67	69	76	14	75	74	65
MIDDLESEX CO.	32	1	65	46	3	50	22	81	33	35	32	87	63	72	6
MILFORD	72	76	67	69	23	31	92	8	68	21	14	5	58	82	81
MILTON	39	57	12	26	98	92	20	61	39	95	88	54	22	35	63
MINUTEMAN	99	102	96	100	42	2	100	12	98	17	98	23	99	102	32
MONTAGUE	98	99	62	95	54	89	62	19	99	57	70	40	96	38	100
NATICK	15	51	19	59	79	15	69	60	15	46	47	7	28	31	24
NEEDHAM	74	35	77	13	34	4	87	72	66	11	16	90	33	101	42
NEW BEDFORD	52	14	41	16	85	42	81	14	51	2	2	68	68	36	39
NEWBURYPORT	65	85	13	64	26	47	68	27	64	78	79	32	84	67	46
NEWTON	40	4	52	44	78	54	26	71	41	53	42	15	31	70	57

SYSTEM RANKING BY SELECTED CRITERIA

TABLE # 5A

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SYSTEM	1985	12/31	1985			1985			DOLLAR	TRANSACTION		1985			
	TIME	ASSET	RETURN	BY	TYPE	ASSET	ALLOCATION	WEIGHT-		ACTIVITY	QUARTERLY RETURNS				
	WEIGHTED	MARKET	EQUITY	FIXED		EQUITY	FIXED	ED		AS % OF ASSETS	FIRST	SECOND	THIRD	FOURTH	
	RETURN	VALUE		INCOME	CASH			CASH	RETURN	PURCHASES	SALES				
NORFOLK COUNTY	26	7	32	17	87	7	89	21	28	23	26	11	50	41	29
NORTH ADAMS	25	83	38	50	13	33	70	37	25	29	36	60	51	32	17
NORTH ATTLEBORO	86	80	71	81	19	41	54	51	86	41	59	94	59	37	89
NORTHAMPTON	47	71	60	86	2	14	73	54	48	14	25	84	62	71	20
NORTHBRIDGE	78	97	68	10	31	30	90	9	77	5	4	2	95	1	88
NORWOOD	91	37	73	80	53	74	44	44	88	76	87	88	87	55	79
PEABODY	31	34	18	28	82	84	13	70	31	88	64	72	20	16	55
PITTSFIELD	21	29	34	48	14	49	46	55	21	64	60	24	25	42	38
PLYMOUTH	5	55	7	12	101	78	2	102	6	100	82	51	4	26	12
PLYMOUTH COUNTY	20	8	44	25	38	56	41	63	20	39	41	82	15	17	23
QUINCY	81	9	39	78	72	81	10	78	82	73	65	66	74	28	84
READING	12	62	47	21	10	58	30	68	12	56	67	30	12	34	9
REVERE	97	44	49	24	46	55	98	3	97	44	37	6	94	90	98
SALEM	75	36	86	15	36	85	72	16	75	50	62	93	81	22	59
SAUGUS	96	78	97	9	89	97	91	6	96	6	6	91	92	65	94
SHREWSBURY	87	74	83	96	92	3	96	45	87	18	18	80	66	87	66
SOMERVILLE	3	21	25	37	48	5	93	28	3	19	19	59	13	57	2
SOUTHBRIDGE	24	95	8	42	95	67	12	84	29	98	75	20	41	18	44
SPRINGFIELD	60	5	29	72	86	38	67	33	59	87	43	16	42	91	69
STONEHAM	28	66	40	27	33	26	75	32	26	58	80	8	17	95	33
SWAMPSCOTT	8	84	22	67	4	10	78	47	7	38	46	35	11	81	4
TAUNTON	30	40	51	33	12	27	35	85	30	62	66	18	40	79	27
WAKEFIELD	70	59	81	23	63	6	88	50	73	12	13	65	54	97	43
WALTHAM	45	23	58	65	11	62	6	99	46	32	31	45	29	69	50
WATERTOWN	68	46	85	74	77	21	53	69	69	22	20	41	24	84	82
WEBSTER	71	96	24	98	100	17	77	26	74	47	45	99	65	56	49
WELLESLEY	35	39	88	39	5	12	48	97	32	7	8	52	43	92	14
W. SPRINGFIELD	94	65	97	93	55	97	16	58	94	33	24	62	91	19	99
WESTFIELD	62	50	61	54	32	43	65	34	62	72	53	13	26	96	77
WEYMOUTH	6	45	78	100	73	1	100	86	5	52	27	1	38	89	62
WINCHESTER	34	61	10	22	43	79	45	42	35	92	100	86	27	15	54
WINTHROP	83	87	95	57	97	80	32	48	83	83	92	85	80	58	73
WOBURN	1	52	6	1	93	39	15	98	1	94	90	28	1	44	5
WORCESTER CITY	79	2	43	92	35	44	27	79	79	75	77	17	55	76	83
WORCESTER CO.	10	6	23	43	20	23	28	92	11	70	81	49	10	10	15

1985

MASSACHUSETTS CONTRIBUTORY RETIREMENT SYSTEMS
INVESTMENT ANALYSIS REPORT

SYSTEM RANKING BY SELECTED CRITERIA

TABLE # 5B

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SYSTEM	1985	12/31	1985	1985	1985	1985			DOLLAR	TRANSACTION		1985				
	TIME	ASSET	RETURN	BY	ASSET	ASSET	ALLOCATION	WEIGHT-		ACTIVITY		QUARTERLY RETURNS				
	WEIGHTED	MARKET	EQUITY	FIXED	CASH	EQUITY	FIXED	CASH		ED	AS % OF ASSETS	PURCHASES	SALES	FIRST	SECOND	THIRD
	RETURN	VALUE		INCOME					RETURN							
WOBURN	1	52	6	1	93	39	15	98	1	94	90	28	1	44	5	
CAMBRIDGE	2	3	30	14	47	9	51	101	2	61	56	70	3	47	3	
SOMERVILLE	3	21	25	37	48	5	93	28	3	19	19	59	13	57	2	
CLINTON	4	88	11	38	59	13	76	53	4	9	10	44	2	43	13	
PLYMOUTH	5	55	7	12	101	78	2	102	6	100	82	51	4	26	12	
WEYMOUTH	6	45	78	100	73	1	100	86	5	52	27	1	38	89	62	
DEDHAM	7	73	92	4	102	95	3	88	10	99	97	101	102	98	1	
SWAMPSCOTT	8	84	22	67	4	10	78	47	7	38	46	35	11	81	4	
MAYNARD	9	93	21	70	16	8	86	31	9	45	33	9	6	48	31	
WORCESTER CO.	10	6	23	43	20	23	28	92	11	70	81	49	10	10	15	
HOLYOKE	11	24	1	40	74	29	64	46	8	68	34	19	5	8	37	
READING	12	62	47	21	10	58	30	68	12	56	67	30	12	34	9	
ANDOVER	13	69	70	7	61	68	11	82	13	91	94	67	101	62	18	
ADAMS	14	94	42	34	67	16	74	49	14	30	21	10	36	54	7	
NATICK	15	51	19	59	79	15	69	60	15	46	47	7	28	31	24	
GLOUCESTER	16	60	35	5	60	51	38	66	16	67	55	36	8	85	11	
LEXINGTON	17	48	5	45	49	35	66	38	17	96	101	4	9	88	30	
ESSEX COUNTY	18	18	33	6	39	65	36	59	19	86	73	42	14	50	26	
FALL RIVER	19	16	84	11	9	93	18	62	18	10	11	95	7	12	34	
PLYMOUTH COUNTY	20	8	44	25	38	56	41	63	20	39	41	82	15	17	23	
PITTSFIELD	21	29	34	48	14	49	46	55	21	64	60	24	25	42	38	
CHELSEA	22	54	74	18	99	75	7	89	22	51	52	98	30	13	21	
BELMONT	23	47	80	47	1	45	14	94	23	40	44	79	39	75	8	
SOUTHBRIDGE	24	95	8	42	95	67	12	84	29	98	75	20	41	18	44	
NORTH ADAMS	25	83	38	50	13	33	70	37	25	29	36	60	51	32	17	
NORFOLK COUNTY	26	7	32	17	87	7	89	21	28	23	26	11	50	41	29	
LAWRENCE	27	27	89	29	57	83	5	90	27	82	83	63	19	7	52	
STONEHAM	28	66	40	27	33	26	75	32	26	58	80	8	17	95	33	
LYNN	29	15	69	51	66	34	19	96	24	16	22	83	35	78	10	
TAUNTON	30	40	51	33	12	27	35	85	30	62	66	18	40	79	27	

SYSTEM RANKING BY SELECTED CRITERIA

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TABLE # 5B

SYSTEM	1985 TIME WEIGHTED RETURN	12/31 ASSET MARKET VALUE	1985 RETURN BY ASSET TYPE			1985 ASSET ALLOCATION			DOLLAR WEIGHT- ED RETURN	TRANSACTION ACTIVITY AS % OF ASSETS		1985 QUARTERLY RETURNS			
			EQUITY	FIXED INCOME	CASH	EQUITY	FIXED INCOME	CASH		PURCHASES	SALES	FIRST	SECOND	THIRD	FOURTH
PEABODY	31	34	18	28	82	84	13	70	31	88	64	72	20	16	55
MIDDLESEX CO.	32	1	65	46	3	50	22	81	33	35	32	87	63	72	6
BRAINTREE	33	41	59	20	56	73	34	52	34	42	40	77	18	52	51
WINCHESTER	34	61	10	22	43	79	45	42	35	92	100	86	27	15	54
WELLESLEY	35	39	88	39	5	12	48	97	32	7	8	52	43	92	14
HAVERHILL	36	33	76	8	96	88	40	39	37	20	17	96	21	3	68
DUKES COUNTY	37	91	26	55	21	32	82	17	38	37	35	100	32	53	19
MASS TURNPIKE	38	17	94	2	52	91	43	35	36	97	95	74	34	30	48
MILTON	39	57	12	26	98	92	20	61	39	95	88	54	22	35	63
NEWTON	40	4	52	44	78	54	26	71	41	53	42	15	31	70	57
EVERETT	41	38	56	61	65	48	24	80	43	27	28	26	23	86	47
BROCKTON	42	11	66	49	81	25	52	65	40	79	74	3	16	100	61
HINGHAM	43	70	28	53	40	77	23	64	44	80	85	56	60	29	35
MALDEN	44	32	64	71	24	40	25	83	42	26	23	69	56	64	28
WALTHAM	45	23	58	65	11	62	6	99	46	32	31	45	29	69	50
MASSPORT	46	10	79	66	15	18	31	100	45	49	48	38	46	93	22
NORTHAMPTON	47	71	60	86	2	14	73	54	48	14	25	84	62	71	20
BERKSHIRE CO.	48	53	16	36	37	69	61	24	49	59	51	22	45	24	72
MARBLEHEAD	49	58	48	89	6	19	37	91	47	25	39	33	52	99	16
MARLBORO	50	68	15	85	83	24	57	56	50	54	54	92	49	2	76
FAIRHAVEN	51	92	55	60	76	11	84	25	52	13	12	21	69	39	53
NEW BEDFORD	52	14	41	16	85	42	81	14	51	2	2	68	68	36	39
BARNSTABLE CO.	53	12	72	52	8	90	8	75	54	85	86	46	57	25	67
MELROSE	54	56	75	32	70	52	58	36	53	89	89	61	47	80	41
ARLINGTON	55	25	82	63	44	36	49	57	65	60	69	48	73	63	56
BRISTOL COUN	56	13	53	83	41	20	47	76	55	34	38	53	37	94	40
EASTHAMPTON	57	90	37	31	7	28	83	15	56	48	58	29	85	77	25
HAMPDEN COUNTY	58	22	2	87	51	53	55	43	58	24	15	64	64	6	74
BEVERLY	59	49	45	19	50	37	85	13	57	1	1	89	77	33	36
SPRINGFIELD	60	5	29	72	86	38	67	33	59	87	43	16	42	91	69
MEDFORD	61	30	57	68	62	66	21	74	60	84	84	58	53	49	70
WESTFIELD	62	50	61	54	32	43	65	34	62	72	53	13	26	96	77
CHICOPEE	63	26	9	73	18	63	59	29	61	81	61	37	89	14	58
LOWELL	64	20	3	56	69	76	60	23	63	3	3	55	71	9	75
NEWBURYPORT	65	85	13	64	26	47	68	27	64	78	79	32	84	67	46

SYSTEM RANKING BY SELECTED CRITERIA

TABLE # 5B

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TABLE #5 SYSTEM RANKING BY SELECTED CRITERIA

Table #5 is presented in two formats: Table #5A lists the systems in alphabetical order.

Table #5B lists the systems such that the system with the highest time-weighted rate of return is listed first and the system with the lowest time-weighted rate of return is listed last.

Table #5 ranks the systems from 1 through 102 according to fifteen different criteria, as follows:

The time-weighted rate of return with the highest return ranked 1 and the lowest return ranked 102;

The size of each system based on December 31, 1985 market values with the largest system ranked 1 and the smallest system ranked 102;

The 1985 return by asset type for equity, fixed income and cash investments with the highest return in each asset class ranked 1 and the lowest return in each asset class ranked 102;

The 1985 asset allocation for equity, fixed income and cash investments with those systems having the largest commitment to an asset class ranked 1 and the system with the smallest commitment due an asset class ranked 102;

The 1985 dollar-weighted rate of return with the system with the highest return ranked 1 and the system with the lowest return ranked 102;

Transaction activity depicted by the percentage of retirement system assets (using December 31, 1985 market values) represented by purchases and by sales with the system having the highest percentage of purchases or sales ranked 1 and the system with the lowest percentages of purchases or sales ranked 102; and

The 1985 quarterly rates of return for the first, second, third and fourth quarters with the system having the highest return in a quarter ranked 1 and the system with the lowest return in a quarter ranked 102.

The criteria by which systems are ranked in Table #5 are all numerically described in Tables #1 through #4. By reference to those tables, the actual value for any criteria for any system ranked in Table #5 can be determined.